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The Chinese have recently sent a scientific expedition into Russia as a sort of response to the numerous expeditions which have visited China of recent years. The chief of the expedition is Miao, a high functionary in the finance department, and the secretary is a savant named Joney, who speaks Russian well. The visitors have been well received, especially at Irkutsk.

Among the very few lakes of South America is that of Tacarigua in northern Venezuela. This was visited by Humboldt, and was then 56 kilometres in length. In 1887 M. Hesse-Wartegg visited it and found that its length was diminished to 49 kilometres. The coasts resemble those of the Lake of Geneva, and its twenty-two islands recall those of lake Pazcuaro in Mexico.

The Pamues, a tribe living upon the lower part of the river Muni, have lately become threatening in their attitude toward the Europeans of the district belonging to Spain, between the Cameroons and the French colony on the Gaboon. As the Spaniards had no available force at hand, the French, who lay claim to part of that coast, had to be called in to protect life and property.

GEOLOGY AND PALÆONTOLOGY.

Contributions to the Knowledge of the Genus *Pachyphyllum*.—Up to 1870 the genus *Pachyphyllum* was not supposed by geologists to be represented in any of the American strata. But in 1870, Dr. White described a new species of coral from the Rockford shales, at Rockford and Hackberry, Iowa, as *Smithia woodmani* (Geol. Rep. Iowa, 1870, Vol. II., p. 188). This species was, however, afterwards shown to belong to the genus *Pachyphyllum*,¹ instead of the genus *Smithia*, to which it was at first referred. Again, in 1873, another new species of coral from the same beds was described by Hall and Whitfield,² as *Pachyphyllum solitarium*, intimating at the same time, however, that the specimen so referred differed from the generic description of *Pachyphyllum* in its being *solitary*. Since that time we have secured very large numbers of finely preserved specimens of this species, together with one new form from the same beds, as well as a

¹ 23d Ann. Rep. Board of Regents of New York State Cabinet, p. 231.

² 23d Ann. Rep. Board of Regents of New York State Cabinet, p. 232.

closely allied new species from the blue shales below the Devonian limestone at Independence, Iowa. A critical study of all these forms showed them to be generically distinct from *Pachyphyllum*, and to constitute a new and well-marked genus. We have also personally collected from these shales three new specimens of *Pachyphyllum*, all of which are described in this paper, thus making four species of this genus known to occur in American strata.

The occurrence of the American representative of this genus only in the Rockford shales of Iowa³ (so far as known) is a fact worthy of note. This fact, together with many others now in our possession, tends to widen the breach between its supposed equivalents, the Chemung group of Hall and Whitfield,⁴ and the Hamilton group of Dr. White.⁵

Pachyphyllum woodmani White,—Compare with description of Hall and Whitfield; (23 Ann. Rep. New York State Cabinet, p. 231.) Coral variable; growing in irregular, flat, convex, hemispheric, oblong or semi-circular masses, from single beds three to four mm. in height to corallums twenty-five and one-half centimetres in diameter. Cell walls, more or less strongly exsert, projecting from less than one mm. to more than eleven mm. above the intervening spaces; from three mm. to one centimeter in diameter (the latter dimension, however, is very unusual). Very often situated at one extremity of the area, and rising perpendicular or obliquely to, or even lying flat upon, the surface of the inner cellular space; wall thin or of moderate strength; central depressions very irregular, circular, oblong or ovate in outline, from one and one-half to five mm. in depth. Rays numbering from twenty-five to forty-one, about half of which extend to the elevation or columella in the centre, while the remainder terminate just within the inner wall. Entire cell from three mm. to about two centimetres in diameter, partially limited by a wall formed by the coalescing of the costæ from the adjoining cells. Intercostal and interseptal spaces divided by numerous thin partitions. Usually the great size to which the exsert portion of the cells sometimes attains is at the expense of vertical height; and likewise when a great height is attained, it is at heavy cost to diametrical proportions. In isolated cases the under surface and margin of the corallum exhibit small patches of epithecal crust; and in still more isolated examples, where the exsert portion of

³ 23d Reg. Rep. New York State Cabinet, p. 236.

⁴ Geol. of Iowa, 1870, Vol. I., p. 137.

⁵ In some cases this genus is known to be represented in the Devonian limestone which immediately underlies these beds and, in one instance, adjacent to it.

the cell attains the greatest height, they are often annulated at the base and centre by epithecal rings; and budding often takes place slightly below the margin of the cell.

The usual method of growth of this species is by lateral budding almost from the beginning, but sometimes a single cell attains a height of from seven to twelve mm. before new cells are formed. This species, as well as all other species of this genus known to me, are, or were originally (with one known exception) attached to the surface of some shell or other species of corals. The delineation of this species is here based upon over two hundred finely preserved specimens. Its range is, so far as known to me, confined exclusively to the Rockford shales, except in some cases where it occurs in the limestone which immediately underlies them.

Pachyphyllum crassicosatum n. sp.—Coral, very coarse, growing in irregular, convex or slightly branching masses, from one and one-half to eleven centimetres in diameter; central depressions circular, from two to seven mm. in depth; wall very thick and strong. Entire cell from one and one-fifth to about two and one-fifth centimetres in diameter, usually limited by a wall formed by the uniting of the costæ of the adjoining cells; and again, this feature is not always well shown, owing to the great irregularity in growth of some specimens. Rays numbering from thirty-one to sixty, often only half of which extend to the elevated perpendicularly perforate columella in the centre, while the rest run out just within the inner wall. In large specimens the bottom of the cell is sometimes occupied by a well-defined, circular depression, instead of a columella. Rays and costæ continuous, passing down the outside of the cell wall and over the intercellular spaces. Intercostal and interseptal spaces divided by numerous thin, straight or convex transverse partitions.

The usual method of growth of this species is peculiar. Generally a large and very coarse curved cell will attain to the height (following the curvature of the specimen) of five and one-half centimetres or more before budding begins, which then takes place slightly below the margin of the cell, or some distance below. This description is from specimens from Owens' Grove, Cerro Gordo county, and Floyd, Floyd county, Iowa. Specimens of a variety of this species occur at Rockford and Hackberry; and differing from those from Owens' Grove and Floyd in the method of growth (which is generally by budding from the first) in that the coralla do not attain to so great a size, and the bottom of the cells never being occupied by a depression, as well as the (sometimes) slightly less coarse character of the

specimens. This species is known to occur only in the Rockford shales at Owens' Grove, Hackberry and Rockford, Iowa.⁶ Although this species is not uncommon at the former locality, yet less than a dozen specimens have been secured from the two latter places during the thirteen successive years that we have collected from these shales. This is a fine species, and cannot well be confounded with any other described in this country.

Pachyphyllum ordinatum n. sp.—Coral compound, growing in regular convex, hemispherical masses, ten centimetres in diameter; point of attachment small. Cell walls abruptly but usually slightly exsert; generally projecting only one and one-half mm. above the intervening spaces; central depressions circular, very regular, three mm. in diameter (rarely a few small young cells are present); entire cells, quite uniform in size and of moderate dimensions, partially limited by a wall formed by the uniting of the costæ from the adjoining cells. Number of rays, from twenty-seven to thirty-two, most of which extend to the slightly elevated centre. Rays and costæ continuous, passing down the outside of the cell wall and over the intercellular spaces. Rays and costæ in well-preserved specimens, slender; but in weathered specimens, strong and broadly rounded or angular. The surface of each cell of this species is slightly concave; sometimes the exsert portion of the cell (which always occupies the centre of the entire cell) is sunk below the outer wall of the cell. This species varies much from *P. woodmani* in its general aspect, the concave surface and greater regularity of the cells, as well as in several other important particulars. Position and locality: Rockford shales, Hackberry, Iowa.

Pachyphyllum crassum n. sp.—Coral usually growing in concave or convex hemispherical masses, from two centimetres to eight centimetres in diameter. Cells usually large, walls strongly exsert, often projecting four mm. above the intervening spaces; central depressions quite regular, from three to five mm. in depth; entire cell from two centimetres in length to one and one-third centimetres in width; when this size is attained, however, it is at the expense of the adjoining cells. At times the large exsert portions of the cells are so crowded together that their bases unite; as many as seven of these projections or elevated portions of the cells have been observed in an area two and one-half centimetres square. Rays numbering from twenty-six to forty-

⁶ Since writing the above, a fine specimen has been secured by Mr. Guy Webster from the Devonian limestone which underlies the Rockford shales, one and one-half miles south of Rockford Grove, Floyd county: also numerous specimens have been secured by us from the same limestone at Floyd.

two, all of which appear to extend to the flattened or very slightly elevated centre. Rays and costæ continuous, passing down the outside of the cell wall and over the intercellular spaces. Rays and costæ down to the base of the cell walls alternating in size. The entire under surface of the corallum, except the point of attachment, covered by a strong, wrinkled, epithecal crust. This is a finely marked species, and differs in many important respects from its associate, *P. woodmani*. This species occurs in the Rockford shales, at both Rockford and Hackberry, Iowa.—*Clement L. Webster, Charles City, Iowa.*

On a Species of Plioplarchus from Oregon.—The genus *Plioplarchus* Cope was established¹ to receive two species of percoid fishes, discovered by Dr. C. A. White in a stratum overlying the Laramie formation in Dakota. The writer has called attention to the existence of fishes in the shales near Van Horn's ranch, on the John Day River, Oregon,² and has suggested that these shales belong to the Amyzon beds. According to Condon, their position is below the John Day Miocene. Dr. Charles Bendire, U.S.A., obtained, among the collections from that region with which he has enriched science, some specimens of these fishes in a condition sufficiently good for identification. They include four individuals which belong to a single species of the genus *Plioplarchus*. They elucidate the characters of the genus as follows:

The vomer, premaxillary, and dentary bones carry teeth of small size in moderate numbers. An elevated supraoccipital crest. The lateral line is present, and the scales are feebly cetenoid. The ventral fins are sustained by a spine in front; the number of the rays cannot be made out. The character of the borders of the operculum and preoperculum cannot be determined, but no serrate edges are presented in any of the specimens. Tail furcate.

The specific characters are as follows: the mouth is small, and opens obliquely upwards. Premaxillary and dentary teeth in several rows. Size larger than that of the *P. whitei* Cope, and the scales are less numerous, and of larger size. The spinous rays are less numerous than in that species and the *P. sexspinosus*. Formula; D. xi.-?; A. vii.-? 12; the soft anal rays at least twelve, possibly more. Scales in five or six rows above the vertebral column, and in ten or twelve below it. Radiating ridges of proximal portion, strong; disc and distal portion scarcely roughened. Caudal vertebræ, 15.

¹ *Amer. Journal Sci. Arts*, 1882; Tertiary Vertebrata, Cope (Vol. III. Report U. S. Geol. Surv. Terrs.) 1885, p. 727.

² *Proceeds. Amer. Philos. Soc.* 1880, p. 62.

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The specimens are all too much injured to permit of complete measurements. The largest measures from the end of the muzzle to the base of the caudal fin 260 mm., and 90 mm. in depth at the vertical fins. The last dorsal spine measures 36 mm. A lateral dorsal scale is six mm. in length.

I propose that this species be called *Plioplarchus septemspinus*.

The general agreement of this species with the two previously known species of the genus renders it highly improbable that they are widely removed from each other in geological age. Prof. Lesquereux has placed the shales at Van Horn's ranch in the upper Miocene, from the evidence of the numerous plant remains which occur there. As the shales are, according to Condon, below the John Day beds of the middle Miocene, they cannot be upper Miocene of the vertebrate scale. *Plioplarchus* has not been found in the Amyzon beds, and the plants of that horizon are, according to Lesquereux, different from those from Van Horn's ranch. The shale may then represent a horizon later than the Amyzon beds, but earlier than those of the John Day. In spite of the evidence of the plants, they may be even older than the Amyzon beds, since the bed of the Dakota *Plioplarchus whitei* is not distinguishable stratigraphically from the Laramie at its summit, according to Dr. White, a statement which I can confirm by personal observation.—E. D. COPE.

On a New Genus of Triassic Dinosauria.—In this journal for April, 1887, I described two species of Goniopodous Dinosauria, under the names of *Cœlurus longicollis* and *C. bauri*, from the Triassic formation of New Mexico. I subsequently discovered that they could not be referred to the genus *Cœlurus*, and placed them provisionally (Proceeds. Amer. Philos. Society, 1887, p. 221) in the *Tanystrophæus* of Von Meyer. I have recently learned that the reputed vertebræ of the latter genus possesses no complete neural canal, so that the position in the skeleton of these elements, on which the genus was founded, becomes problematical. It becomes evident that the Triassic species in question must be referred to a genus distinct from any hitherto known, differing from *Cœlurus* in the biconcave cervical vertebræ, and from *Megadactylus* in the simple femoral condyles, as well as in other points. I propose that it be called *Cœlophysis*, and the three species, *C. longicollis*, *C. bauri*, and *C. willistoni* respectively.—E. D. COPE.

The Ophitic Band of Andalusia.—M. Salvador Calderon contributes a study of the epigenic region of Andalusia and of the origin of its ophites to a recent issue of the *Bulletin* of the Geological

Society of France. An ophitic band extends in a W. N. W. to E. S. E. direction from the coast of the Province of Cadiz to the Sierra de Moron; here it bends to the east until it reaches Antiquera, where it again bends northwards, until it dies out in the Province of Jaen. The direction of the band is influenced by that of the cordillera, and its width in general diminishes as it recedes from the coast. Whoever traverses this region is struck by the difference between its orography and vegetation and those of the rest of Andalucia. This ophitic band is not confined to one geological stratum, but traverses Liassic, Neocomian, and lower Tertiary beds, so that the metamorphism has been effected by a similar series of causes acting upon different materials, and therefore producing different results. Throughout the band innumerable points of crystalline rocks exist, and have been designated ophites by Mr. Macpherson, who compares them with similar rocks in the Pyrenees. These ophites occur in masses of no great size and of circular form, and often in rounded hills, covered from the base to summit with many-sided fragments of the same rock. More than four hundred of these ophitic points are known at various levels, and many others must be hidden. Two theories have already been put forth with regard to the origin of ophitic rocks: that of a magma coming from the interior of the globe, and that of chemical deposition, without heat, in the depths of seas, where the débris of primordial rocks have accumulated. This latter theory is sustained by MM. Verlet d'Aoust and Dieulafait.

M. Calderon adds a third theory, which he believes to be the only one that will explain the phenomena to be found in Andalucia and in the Pyrenees. He maintains that ophites are the products of a vast metamorphism produced by orogenic movements upon argillaceous rocks impregnated with divers chemical elements. The relations which always exist between these ophites and the movements which have taken place in the formations in which they lie have long been known to geologists, but, taking the effect for the cause, they have believed that the ejaculation of igneous matter from the interior of the earth has been the cause of the movement of the strata; and also of the chemical transformations. For the region treated of no trace of those phenomena of contact which show the influence of matter in fusion, and no trace of vents of eruption, have been found. The ophitic rock has not penetrated the beds, and usually lies at the bottom of the folds. The clayey and marly beds, permeated with other minerals and with water, have brought together into the cul-de-sac formed by their folds all the conditions necessary for a chemical change, and

denudation has in many cases afterwards brought them to the surface. M. Calderon concludes with these words: "I do not think that it will be too bold to conclude, as a general law, that *when a saliferous formation, rich in marls and clays, magnesia and gypsum, is exposed to tangential force, it must produce the epigenic phenomena known as ophitic, and give birth to true massive crystallized rocks in its anticlinals.*

Vertebrata of the Swift Current River.—No. III.—My second contribution to the knowledge of the fauna of the White River Miocene, as exhibited at the above locality, appeared in the NATURALIST of the present year, p. 151. The researches of Mr. T. C. Weston during the past season, under the direction of Dr. Selwyn, Chief of the Survey, have added a number of interesting points to our knowledge of the fauna, and the following new species:

Menodus selwynianus sp. nov.—Represented by a nasal process, which consists of the coössified nasal bones, of peculiar form. They are elongate as compared with their width, and are vaulted. The lateral borders are nearly parallel, and the extremity viewed from above is rounded. Owing to the thickness of the body, the profile descends abruptly at the extremity, and the convex surface is roughened as though for the attachment of some fixed body, tegumentary or muscular. From this tuberosity the surface descends steeply to a thin border. A short distance posterior to the extremity the lateral margins are decurved, forming the lateral walls of a deep longitudinal median gutter-like nasal meatus, which is deeper than in any other species. The horns are broken off, but the median inferior surface is so little recurved laterally, that it is evident that the former were not only small, but laterally placed. Length of fragment above, mm. 130; length of nasal border, 70; width at nasal notch, 80; do. near extremity, 65; depth at apical tuberosity, 26.

This species is dedicated to Dr. A. R. C. Selwyn, the accomplished director of the Survey of Canada.

Menodus syceras sp. nov.—This species belongs to the group with muzzle and horns of moderate length—the central group of Scott and Osborn. It differs from the two species of that group now known, the *M. proutii* Leidy, and the *M. tichoceras* S. and O., in the very close approximation of the basis of the horns, and the presence of a strong angle or ridge connecting them, so that the nasal bones are in a different plane from that of the front. The entire width of the skull at the basis of the horns is not greater than the length of each horn above the nasal notch. The horns are not long, and the section of their base is a longitudinal oval, flattened on the external side.

Summit subround. The nasal bones are flat, with broadly rounded extremity, and are much wider than long.

The width of the nasals at the base of the horns is 116 mm. ; length of do. from do., 70 ; diameters of bases of horns ; anteroposterior, 94 ; transverse, 67 ; length of horn from nasal notch, 160 ; width of muzzle at bases of horns inclusive, 160.

The nasal bones of three individuals present the characters above given. The close approximation of the bases of the horns does not exist in any other species known to me.

Elotherium coarctatum sp. nov.—Represented by a left mandibular ramus with condyle, which supports all of the molar teeth. The species differs from the *E. mertonii*, with which it agrees nearly in size, in having all the premolars in a series uninterrupted by diastemata, except a very short one between pm. iii. and iv. The second premolar is the most elevated, and the third and fourth are abruptly smaller. The fourth has one compressed grooved root. The molars are peculiar in having the two anterior cusps elevated above the three posterior ones, as in *Miocænus* sp. The posterior, or fifth tubercle, is well developed, especially on the m. iii.

Length from condyle to edge of canine alveolus, 295 mm. ; do. to last molar, 125 ; do. of true molar series, 67 ; do. of m. i., 22 ; width of do., 13 ; elevation of p. m. ii., 21 ; length of base of crown do., 28 ; depth of ramus at m. i., 55.—E. D. COPE.

Geological News.—General.—A geological map of the northern part of Tunis was recently presented by M. Rolland to the French Geological Society. According to a small transcript of the above in the Bulletin, by far the greater part of this region is Pleistocene or Pliocene ; but there is a mass of Eocene between Bizerte and Cape Farina, and two others east of the Gulf of Tunis, besides a much larger mass west of Bizerte. Considerable areas of upper Cretaceous also exist west and southwest of Bizerte. On the edge of the Gulf of Tunis the Djebel Bou Kournine rises to a height of 689 metres, and is the first of a series of mountain masses which follow each other toward the south and southwest for 75 kilometres, and which culminate in the Djebel Zaghouan (1340 m.) These mountains are of coralligenous marble, compact, full of debris of encrinites, etc., but as a rule are without determinable fossils. A marly stratum upon which they rest has debris of belemnites. Some remains of ammonites that have been found in the marbles seem to prove that the latter are of Jurassic age.

M. Stuart Menteath has recently made before the French Geological

Society respecting the action of soft strata that have either naturally or artificially been deprived of their original support, some observations that seem to have an important bearing. The great open quarry of the Rio Tinto mines (near Huelva, Spain) is 400 m. long, 200 m. wide, and nearly 100 m. deep. On the southern side there is a mass of clayey schists deprived of support, and having normally a dip to the north. These schists are now taking on, at least near their surface, a dip to the south, and this dip extends at least five metres deep. At the bottom is a mass of solid ore, against which the lower beds of the schists are reduced to powder which is easily washed away by rains, and is expelled by the pressure of the upper layers. This removal causes the settling and gradual overthrow of the upper beds. Not many kilometres distant a similar phenomenon occurs, but here the agent is a torrent which has gradually scooped out a ravine. That which at Rio Tinto has taken place so rapidly that its progress can be noted from month to month, may easily have occurred more slowly in numerous places where the removal of material has been slow; and M. Menten asks whether it has not often been the case that geologists have estimated the dip of the strata from this comparatively recent, yet in many cases extensive, reversing of the normal dip.

M. W. Kilian recently presented before the French Geological Society a geological description of the Montagne de Lure in the department of Basses Alpes. This work of 458 pages and 11 plates treats of the physical constitution of this mass; of its strata, which commence with the Trias and end with the Tertiary; of the dislocations which have given the chain its present relief; and of its palæontology, with a description of some interesting species found in it.

The new map of the geology of the environs of Paris, on a scale of 1-20,000, is the most complete yet made. The gypsose period is subdivided, and the Pleistocene deposits are carefully shown. Soundings taken in the bed of the Seine have proved that under the river exists a stratum of gravel 10 to 15 metres thick. The highest gravels of the terraces are at Lagny, 19 metres above the Marne, and at Poissy, 27 metres above the Seine. The surface of the chalk is not as much cut up by ravines as was supposed, but has uniform slopes consisting of two synclinal axes and an east and west anticlinal.

Carboniferous.—The Bulletin of the French Geological Society (Nov., 1888, to Jan., 1889) has a note by H. E. Sauvage upon the Palæoniscidæ of the Commeny coal-beds. These beds belong to the upper part of the coal measures. Some 400 specimens of fishes,

most of them in an excellent state of preservation, have been furnished by these beds, and two species have previously been described by Brougniart and by Egerton. M. Sauvage mentions *Amblypterus fayoli*, *euryi*, *commentryi*, *renaulti*, *elaveris*; *Commentrya traquairi* and *C. brongniarti*, *Elaveria fayoli* and *E. gaudryi*, and *Comospoma typica*, and gives the leading characters and a side view of the head of each.

Mesozoic.—Numerous species of Jurassic polyzoa, found at Boulogne-sur-Mer, are described by M. H. E. Sauvage in the Bulletin de la Societe Geologique de France, 1889. Five of the species are new.

H. Larrazet describes some fragments of a *Steneosaurus* found at Parmilieu (Isère, France), in the compact lime-stones of the upper part of the Bathonian stage which furnishes Lyons with free-stone. These fragments present some peculiarities, but the material is not sufficient to warrant the foundation of a new species (Bull. de la Soc. Geol., 1889).

M. P. de Loriol has recently described two species of echini, one from the Senonian of Algiers, the other from the Cretaceous of Turkestan. The latter is made the type of a new genus.

M. Bertrand (Bull. Soc. Geol. France) contributes an interesting note relative to the horizontal folds or *plis couchés* of the region of Draguignan. Some of these folds are so acute that a portion of an older formation is completely enclosed by newer beds.

M. Jules Welsch notes the presence of Gault and Senonian beds in the high plateaux of Oran (Algeria), and remarks that the maximum invasion of the Cretaceous sea over the more ancient strata took place at the lower Senonian epoch.

The Cretaceous strata of a portion of Algeria, with the fossils contained in the different stages, are the subject of a long communication recently made to the French Geological Society. Albian (Gault), Cenomanian, and Senonian horizons are identified, and the Gault and Cenomanian are stated to be unconformable.

Coraster vilanovæ, a small echinid previously believed to belong to the Eocene, has recently been proved to be a Cretaceous species, and has been found in the Pyrenees at Alicante, and also at Tersakhan, near Ashkhabad (Turkestan).

The geological constitution of the environs de Puy (Haute Dome) from the Eocene to the Quaternary, forms the subject of a note presented on January 21, 1889, to the French Geological Society by M.

M. Boule. The considerable number of fossils favors identification of the beds. The author observes that the region is traversed by faults, a fact seemingly hitherto unperceived by geologists.

M. G. Cotteau, continuing his researches among the Eocene echini of France, has discovered many new species, and described several others which previously had been mentioned but not described. Most of the forms seem to have been local; those of the north of France and of the Paris basin are not the same as those of the southwest, and those of the Pyrenees and of the Mediterranean regions are again different.

M. Landesque (Bull. de la Soc. Geol., 1889), describes and illustrates the Tertiary strata of the Agenais and of Perigord (France). These strata, commencing with the upper Eocene, rest unconformably upon the Cretaceous, and their classification is by no means satisfactorily made out. The lowest bed is a more or less homogeneous mass of sand, colored by oxide of iron, and above this commence alternations of beds of sand and of calcareous clay, in the latter of which have been found six species of Palæotheria, two of Paloplotherium, *Pterodon dasyuroides*, an Hyænodon, *Xiphodon gracile*, and some crocodiles and chelonians. According to our author the white limestone of Perigord belongs only partially to the Eocene system, the two upper of the three beds of which it is composed belonging to the Miocene. The quadrupeds of the Miocene beds are much more numerous than those of the Eocene, and comprise species of *Mustela*, *Hyænodon*, *Cynodon*, *Amphicyon*, *Lutra*, *Cervus lamilloquensis* (nov. sp.), *Palæochærus*, *Anthracotherium lamilloquense* (nov. sp.), *Cainotherium*, *Amphitragulus*, *Rhinoceros lamilloquensis* (nov. sp.), *Theridomys*, *Arctomys*, *Erinaceus*, *Talpa*, etc. There are also many undetermined crocodilians, some chelonians, and numerous *débris* of fishes, birds, batrachians, and snakes. These fossils have been found by M. Landesque at Lamilloque, Caillabet, and Comberatière, especially at the former places.

M. Paul Gouret contributes to the *Bulletin de la Société Géologique de France*, a geological study of the marine tertiary of Carry and Sausett (Bouches-du-Rhône, France). The locality is exceedingly rich in fossils, principally gastropods and lamellibranchs, but including some corals and echini.

M. Cotteau has lately presented to the French Geological Society a memoir of the Eocene echini of the province of Alicante (Spain). Seventy-five species, belonging to seven families, are described for the

first time. This is a profusion of echinid species and genera in a limited area surpassing anything hitherto found. Some of the thirty-seven genera are very rare and four are new. These are *Pygospatan-gus*, among the *Spatangidæ*, *Stomaporus* among the *Brissidæ*, *Microlampas* (*Cassibulidæ*), and *Radiocyphus* (*Diadematidæ*).

BOTANY.

The Flora of Central Nebraska.—A botanical collecting field perhaps as interesting as any to be found in the United States is the sand hill region of Central Nebraska. Not particularly interesting from its rare or remarkable flora, perhaps, but from the general ignorance in regard to it. Year after year Eastern collectors have passed over this *arid region* on their road to the Rockies, preferring pleasanter collecting fields.

This summer, while on a collecting trip for the Department of Agriculture, in company with Lawrence Bruner, western entomological agent for the Department, I spent several days on the Dismal and Loup Rivers, in Thomas county, Nebraska. As this is in the very heart of the sand hill region, a few notes especially on the Dismal River trip may not be without interest.

We started for the Dismal River, of which we had heard much from the settlers, in the early morning of the 12th of July. We were accompanied by Mr. Wright, a farmer of the place (Thedford), and Mr. Harper, a sportsman. For several miles we drove up the valley of the Middle Loup River, here a stream about fifty feet wide, averaging three feet deep, and with a remarkably swift current (about eight miles an hour). In the valley the grass is very rank, composed chiefly of *Agropyrum glaucum* R. & S., *Kæleria cristata* Pers., *Elymus canadensis* L., *Panicum virgatum* L., etc., intermixed with sedges, and in places with rank growths of *Onoclea sensibilis* L., and *Aspidium thelypteris* (L.) Swartz.

We soon left the bottom lands, and began climbing the sand hills up over the divide. From all that I had heard of them I expected now a long, tedious ride, but not so. I was surprised at the great variety of flowers we found. We were kept constantly busy pointing out the different kinds and watching the flight of insects. At times we wearied our driver not a little by the frequency of our stops, although for a farmer he was quite a naturalist. The prairies were spotted with the great white flowers of *Argemone platyceras* Link and Otto, and